



A HISTORICAL AND PHILOSOPHICAL METHOD BASED ANALYSIS AND MODIFICATION OF KARDASHEV SCALE AND PREDICTION OF FUTURE SCIENCE AND TECHNOLOGY

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Abstract: Critical analysis of the Kardashev scale on advancement of technology and human civilization is made. A new theory of advancement of civilization and technology is presented. Based on the new theory, Kardashev scale is modified. Kardashev scale was made based on the linear or exponential growth of human civilization and technology. But the modified scale is based on the spiral path of growth and predicted to contain four cycles of growth to know all about the world. In the first section of this article, Kardashev scale is analysed. New theory of advancement of science, technology and human civilization based on the history of human civilization is presented. Fundamental design principles of the cosmos is presented in the second section. New theory of growth of science, technology and human civilization is presented. Then the future of science and technology is predicted. At the end, complete automation of the economy is predicted to happen within 2050.

Key words: Civilization, Energy, Kardashev scale, modification and future science and technology.

Introduction: Critical analysis of the Kardashev scale on advancement of technology and human civilization is presented. New theory of advancement of science, technology and human civilization based on the history of human civilization is presented. First a theory of knowledge advancement is presented. Then fundamental design principle of the Universe is described. Finally, based on the theory of advancement of knowledge and human civilization and the fundamental structural design principle of the cosmos, future of scientific and technical progress is predicted and the limitations of human intelligence is also described. Growth of human civilization and technology is proved to take place in a spiral path and not in an exponential path. Predictions on the growth of civilization and technology based on Kardashev scale are predicted to be a possibility as per the new theory of civilization and technology growth. However, obtaining energy from distant places need advancements in high speed transport technology. Therefore, prediction on human civilization and technology based on Kardashev scale is limited by this factor. Therefore, based on the theory proposed in this article, progress of human civilization and technology is predicted to contain four stages. [1-18]

1. Kardashev Scale: Kardashev scale on progress of technology and human civilization was developed based on increased demand for energy rapidly by the civilization as it progress due to increased population and energy requirements for machines. The Kardashev scale is incorrect because the assumption that need makes the man to invent is not always correct. This scale was developed under the assumption that technology and energy production capacity of civilization will grow up with the growth of human civilization. This prediction is true, but the direction of the growth predicted and assumed is not correct since Kardashev scale is exponential, whereas the actual scale of progress of technology and civilization as described in this article is spiral and therefore cyclical in nature. As per the theory presented in this article, the Kardashev scale is valid only under short term conditions. Moreover, Kardashev scale predicts unlimited capacity of human civilization for growth of technology and civilization. This is also found to be incorrect as per the theory presented in this article. Kardashev scale also failed to include the problems of industrialization like environmental pollution and other economic problems.

As per the Malthusian theory of population, war and diseases will control the population growth. However, advancements made in medical science and technology has reduced the death rate all over the world. But there are viruses like Corona which has affected the people and their economies all over the world recently. Discovery and distribution of the vaccine took some time. But the virus has quickly transformed and made the vaccine ineffective. The environmental problems also may lead to famine, flooding, reduction in agricultural production and poverty. As a consequence population growth will be controlled by environmental pollution factors also. Therefore, need for more and more energy will be reduced if the population growth is reduced.

Moreover, one can't believe the unlimited capacity of man to discover laws and invent technologies as the demand for energy increases. Human civilization is older than 6000 years. But energy production capacity of man increased only after the age of industrialization some 200 - 250 years ago. In the past in all civilizations of the world, technology was developed only over a short period of time at the end of civilization. Therefore, Kardashev scale is based on very short period of human progress in Technology.

Moreover, due to rapid advances made in technology and industrialization all over the world and increased population, consumption rate of nature has increased vastly and available natural resources and raw materials are drained very fast. This is additional factor which limits the energy production capacity of man. Nuclear and space technology gives hope on improved energy production capacity of man. However, fuel available for nuclear reactors is limited and technology is available only with few countries and building nuclear reactor with safe technology is complicated since nuclear leakage and death has happened in many reactors all over the world. If nuclear technology and fuel is given to all countries, possibility of spreading nuclear weapons increases and global security is damaged heavily. Therefore, this factor too limits the energy production capacity. In the past history of human civilization, wars reduced the population growth. The Moore's law of electronics is comparable to Kardashev scale. But Moore's law is limited to very short time period of about 50-60 years (1960s to 2019). Therefore, Kardashev scale is valid only over a period of some 100-300 years since the present age of discoveries and invention has already ended [1-9].

2. Cosmology and the origin of life: As far as origin of Universe is concerned, it came out from very hot and dense radiations (High energy radiations). Bible too says the same, in the beginning God said, "let there be light (energy)" and there was light. Earth and other planets originated from the spiraling of hydrogen gas centered at the Sun's location. As earth cooled from hot conditions, from ice to water, atmosphere originated. Then when water was absorbed or drained, or displaced, land originated. From the water and moisture of land all seeds of life forms originated. Actually, all on earth must have been formed in the nuclear reactions of hot earth, when earth cooled down to normal life supporting temperature over a long period of time. Actually all seeds of plants and animals seems to have originated from a nuclear fusion reactor of the earth separated from the Sun. Earth in the beginning seems to have been a nuclear fusion cooker in the kitchen which produced seeds of life by cooling, spinning and rotational mechanisms. Then from the seeds, plants, animals and human beings must have originated as per Darwin's theory of evolution. Therefore, basically seeds originated from natural thermo-nuclear reactors of the earth. This means earth must have passed through a stage of thermo-nuclear reactor to produce seeds of different life forms. Therefore, a 2 Billion Years Old Nuclear Reactor in Oklo deposit in Gabon, a former French colony in West Africa must be the part of the earth when the earth was a natural thermo - nuclear reactor state. Therefore, next and future chapter of Physics is going to be on Nuclear Physics and the origin of Earth (including life on the Earth). At present only on the Earth we see the existence of life. Therefore, Physicists and cosmologists must turn towards doing research on origin of earth and life [10-13] [19-26].

3. Progress of Civilization and Technology: We know almost all laws of non living material world since mechanism of large scale matter, Laws of atomic physics, Electromagnetism and Energy are almost completely known to us. This is the reason why we are able to form almost a complete theory of cosmos. We are able to confirm the Biblical theory of origin of the world. Man is a microcosm of the world since man is made up of parts of matter, plants, animals and Ultimate Intelligence which made this Universe. Therefore, if we know all about the man (humanity), we will know all about the world. Now, we have made all comforts or technologies required to satisfy the external sense organs of man. We even made computers to satisfy internal organs of man namely mind and brain. All parts of the globe are occupied by human beings. We have even reached the moon and just started the space travel. We have made weapons of mass destruction to destroy the earth completely many times. Computers communicate with each other like human beings. Robots are made which mimics the functions of human beings.

Political power of the globe has shifted from Europe to North America like it was shifted from Greeks to Romans in the ancient world. Ancient Greek and Roman cultures are comparable to present day European and American cultures respectively. Christianity was born and spread under Roman Empire of the ancient world. In the beginning of last century, science and technology exploded like anything and grew exponentially till the end of the century. Now, in the beginning of the 21st century, no new science and technology is born. Therefore, the age of discoveries and inventions born some 500 years ago in Europe is over now. The last 500 years of age of discoveries and inventions is just the result of accumulated creative experiences of Europeans in their languages and cultures over 1500 years since the time of birth of Christianity. In the ancient Greece, accumulated experiences over 1500 years flourished into 500 years of Greek discoveries and inventions before Christ. Therefore, first phase of discoveries and inventions is over.

Therefore, next 1500 years period is for integration of cultures of the world by most advanced language and religion of the world. World consists of matter, plants, animals and human beings. Therefore, next 2000 years is for finding the laws of physics and chemistry of plants and improving technology. Third 2000 years is meant for finding the laws of physics and chemistry of animals and improving technology. Fourth 2000 years is meant for knowing the laws of physics and chemistry of human beings and improving technology. Therefore, knowledge, technology and civilization progress in a spiral path and not in an exponential way.

Kardashev scale is based on exponential growth of technology and civilization. Therefore, Kardashev scale and predictions are incorrect [12 -23].

4. Next Chapter of Science and Technology: There are three realities exist in the world. One is mathematical and other one is physical and the third is combination of both. There is a correspondence between mathematical reality and the physical reality. Mathematical realities include non physical realities also. Similarly physical realities include non mathematical realities too. Part of the physical realities are accessible to human sense organs and remaining are not accessible to sense organs. Micro and macro cosmic realities are the examples. Physical realities also include combination of mathematical and non mathematical realities also. For example verbal realities are non mathematical in nature. Mathematics is a very powerful tool available to discover and understand the physical reality. Experimental methods are other very powerful tools available to discover and understand the physical reality. Modern physics was largely developed by the mathematical and physical speculations or guesses or assumptions made to solve contradictions of the mathematical and physical realities. Therefore, understanding of modern physics is made very complicated to all. Now, physical sciences have progressed to the level of building a standard model of the Universe. Therefore, now it is time to start understanding the modern physics by deriving the laws of modern physics known to us from first principles or fundamental physical realities which are accessible to human sense organs. In other words all laws of physical realities must be interlinked or internetworked to derive the advanced realities from basic realities. In this way modern physics could be understood well and new technologies may be developed. In this way, direction of science and technology has to be reversed back from the beginning of the physical world to the earth from where all sciences began to develop. When we come back to the earth by deriving laws from the beginning of the world, we could start applying the laws of physics to biological world and start understanding them better. [12-13] [21-23].

5.Future Science and Technology: After Jesus Christ, universe was considered as earth centered universe by the Church. In the beginning of modern age of discoveries and inventions, scientists proved that the universe as sun centered universe. Now, the universe is proved to have originated from big bang explosion of energy and matter. Our planetary system is centered on Sun. This age of discoveries and inventions is over for now. Creative thoughts and experiences accumulated in European, Mangloid and other languages over 1500 years has been used make discoveries and inventions in the last 500 years. Therefore, the history of creative information is back to the initial time. This means, future age of science and technology will be centered on earth.

All matter, plants, animals and human beings are made up of variety of complex atoms and molecules. All living organisms absorb energy from external world and grow up. Therefore, there is a automatic biological growth program exists in all seeds and eggs of living organism. This program is responsible for the growth and functions of all living organisms. Making hardware for biological bodies seems to involve nuclear reactions of stars, cooling and other special conditions required. Therefore, mastering over thermo nuclear reactions is the key to making biological materials. Man always makes technical products by learning from and using the nature. Therefore, maximum capacity of man in making technology will be making earth like planet and all plants, animals and human beings on the earth. Therefore, these predictions to come true needs high speed space transport technology and breakthroughs in thermo nuclear technologies. Therefore, energy production capacity of human civilization could be as per Kardashev scale.

If one knows all about man, he can know all about the world. Now, man has made technology to satisfy all his sense organs. In addition he made technical comfort (computers and communication technology) to his mind and brain. Therefore, man has made a robot like human being using non living matter. At the end of each age of discoveries and inventions, the humanoid robot will be improved in addition to over all technical advancements. At the end of 2000 years from now, man will make all plants from soil. At the end of 4000 years from now man can make all animals from soil. At the end of last age of discoveries and inventions (approximately at the end of 6000 years from now), man could make himself from the soil. This means, man could build a earth like planet from the clouds from which stars originates. Stars and planetary systems develop by thermo nuclear reactions. Therefore, man will acquire complete knowledge about the solar and earth system at the end of 6000 years from now.

For the production of energy in the future, nuclear fuel is required. Now, nuclear fuels are produced from natural sources which are close to nuclear fuels. This nuclear fuel production technology will expand to include more and more natural resources which are away from nuclear fuels. At the end of 6000 years from now, man will acquire capacity to produce nuclear fuel technology from any element. All matter particles originated from energy in the beginning of the universe. These particles originated through thermo nuclear fusion reactions. Therefore, by splitting the nucleus, nuclear energy is produced. But in sun and stars, nuclear reactions are thermo nuclear fusion reactions. Therefore, earth and planets must have originated by thermo nuclear fusion and chemical reactions at lower temperatures as compared with the temperature of the Sun. Therefore, understanding of thermo nuclear fusion reactions at lower temperatures will lead to finding the methods of producing nuclear fuels from complex atoms and molecules.

Since nuclear fusion reactions take place at higher temperatures, control of energy becomes more complicated. In nature, thermo nuclear energy released from fusion reactions are received on the earth without any harm due to the astronomical distance of separation and protective layers of atmosphere. Therefore, by multiple layers of reflection and cooling, the nuclear fusion energy could be contained and controlled. The amount of control has to be increased gradually from the center of the reactor to outward layers. Therefore, building a thermonuclear reactor and producing energy is vital for further understanding of nuclear fusion reactions and production of nuclear fuels. Therefore, human civilization and technology will make progress through four stages and not as per Kardashev scale.[1-26].

6. Complete automation of the economy: As explained in the previous section, one cycle of human progress is over now. The last part of Italian renaissance is world wide socialist revolution. During the period 1917 to 1947 communism spread all over the world. It was stable till 1989. Then, democratization and liberalization of communist economies happened all over the world. This revolution has ended in 2019. So, the age of discoveries and inventions has ended. Since one cycle of the progress is over now, the world is back to the beginning. In the beginning, all were available at free of cost to all. Man is the ultimate product of the nature. Now, as described in the previous sections, AI and Robots are made like man was made in the beginning. So, world wide socialism ended and new age of automation of economics is born. The complete automation of the economy will happen within 2050 like world wide socialism spread within 1950 from 1919.[27-28]

7. Energy harnessing technology: Energy harnessing technology should be made within non living material world in all the types of civilization of Kardashev scale. As mentioned in the previous paragraphs, all the possible discoveries and inventions of the non living material world is over now. So, energy harnessing capacity of the human civilization seems to be over. Life on the earth is theorized to have originated from the interaction of Earth's magma and water. So, life originated from the cooling process of magma by the water and other chemicals dissolved in the water. So, the energy harnessing technology of the future will be limited to the planet Earth. Since, life originated from the chemical reactions between hot magma and the water and chemicals of the water, future discoveries will be made in the biochemical laboratories at the temperatures of magma. So, future energy harnessing technologies will be limited to the temperature of the magma (thermal energy at magma temperatures). As per the cosmological principle, the universe looks the same from wherever one looks at. So, all civilizations of the universe must be at the same level of progress. In other words, all the civilizations of the universe must be equal.[29]

8. Contacting the extraterrestrial intelligence: The universe is 13.8 years old and we can get only the signals from the places younger than the earth because of the curvature of the field (and the space as per the general theory of relativity) and the expansion of the universe. Similarly, signals sent from the earth will be received by the places older than the earth. So, more advanced civilizations can't send signals to the less advanced civilizations. Only one way communication is possible. [30].

Conclusion: Kardashev scale on progress of technology and human civilization was developed based on increased demand for energy rapidly by the civilization as it progress due to increased population and energy requirements for machines. Kardashev scale was made under the assumption that need for the energy and invention of the technology for satisfying the need increases linearly. Such assumptions are proved to be incorrect. Such assumptions are valid over a short term period and so, Kardashev scale is proved to be valid only a very short term period of about 200-300 years of industrial revolution whereas renaissance period is about 500 years. So, only during the renaissance period of about 500 years Kardashev scale is valid. But the new theory of human civilization and technology and the modified Kardashev scale are valid over a very long period of time which includes the renaissance period. So, the modified Kardashev scale is cyclical and has 4 cycles of each about 2000 years. One cycle of progress is over now and remaining cycles of progress will be made in next about 6000 years. At the end, impossibility of civilization beyond type I is proved. All the civilizations of the universe are proved to be equal and similar. At the end, impossibility of sending signals to the less advanced civilizations from the more advanced civilizations is proved.

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